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AN UPPER TERTIARY PECCARY FROM INDIA

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INTRODUCTION

The distribution of fossil and recent bunodont artiodactyls has shown that the Suidae, or the true pigs, have always been limited to the Old World, while the Tayassuidae, or peccaries, have been and are characteristic of the New World, and so clear-cut have been the restrictions of these two families to the two hemispheres that palaeontologists and zoologists have come to look upon their geographic separation as almost an ironbound law. In fact, Dr. W. D. Matthew, in his brilliant essay "Climate and Evolution," indicated separate centers of origin for the pigs and the peccaries.[1] The former, according to Doctor Matthew, had their origin in Central Asia, while the latter began their phylogenetic development in the western portion of North America.

Recently, however, Miss Helga S. Pearson, following the lead of Hans G. Stehlin, suggested that peccaries actually were present in Europe during the Oligocene period.[2] She based her conclusions on the characters of the genus *Doliochoerus*, which form she considers to be of tayassuid rather than of suid affinities.

Certain specimens discovered by Mr. Barnum Brown, in the Punjab of northern India, during the course of his explorations in the season of 1922 for the American Museum, would seem to confirm Miss Pearson's conclusions as to the presence of Tertiary peccaries in the Eastern Hemisphere. These specimens, which will be described in this paper, consist of several teeth that would seem to represent a strange but nevertheless a true peccary. The teeth, when first found, proved to be very baffling, and it was only after careful comparisons with numerous specimens from different mammalian orders, as well as long considerations of all the probable taxonomic possibilities, that the specimens were finally assigned to the Tayassuidae. During the course of this study the author

[1] Matthew, W. D. 1915. 'Climate and Evolution.' Ann. New York Acad. Sci., XXIV, p. 241, fig. 21.

[2] Pearson, H. S. 1927. 'On the Skulls of Early Tertiary Suidae, together with an Account of the Otie Region in some other Primitive Artiodactyla.' Phil. Trans. Roy. Soc. London. Series B, Vol. 215, pp. 400–403, 409–410, 458.

had the constant and interested aid of Dr. W. K. Gregory, and by means of this help a better understanding of the fossils under consideration was obtained.

The drawings and charts illustrating this paper were made by Margaret Matthew.

DESCRIPTION

Pecarichoerus orientalis, new genus and species

TYPE.—Amer. Mus. No. 29955. Various isolated upper cheek teeth; particularly an RP^4 (?), LM^1, R and LM^3.

HORIZON AND LOCALITY.—From the Chinji zone, Lower Siwaliks, at a point 1600 feet above the level of Chinji Rest House. The specimens were found three miles west of Chinji Rest House, in the Salt Range, Northern Punjab.

DIAGNOSIS.—Molar teeth short, brachyodont and quadricuspid. Cusps conical and separated from each other. Median valley of the third molar occupied by sharp, oblique ridges, which run between the anterior and the posterior pairs of cusps. Enamel smooth.

The isolated fragments which go to make up this new type have been identified as follows:

1. The alveolus of an upper premolar tooth.
2. The roots of an upper premolar tooth.
3. A right and a left upper premolar tooth.
4. A right and a left upper first molar.
5. A right and a left upper third molar.

Obviously the first two items listed above are of little value for the purpose of identification or study. As to the two premolar teeth, they have been subjected to rather hard usage, with the result that they are worn and broken to an extent that makes their determination difficult. The two first molars, though fairly complete, were subjected to a great deal of occlusal wear during the life of the animal, so that the coronal patterns were entirely obliterated. Consequently we must rely on these teeth mainly for the purpose of general shape and proportions. The two third molars are complete and only slightly worn, thereby furnishing us the only reliable information as to the probable affinities of this animal.

The first molar is a tooth of rectangular shape, being somewhat longer than it is wide. Evidently in the unworn condition the tooth was quadricuspid, the cusps being somewhat oblique to the midline of the tooth.

The last molar is quadricuspid, there being evidently the protocone, paracone, metacone and metaconule represented. These four cusps are round and quite separate from each other. There is a distinct and a rather broad anterior cingulum, and back of this a short ridge or bar runs

transversely across the front of the tooth, connecting the anterior edges of the protocone and the paracone. From the outer or buccal side of the protocone a ridge runs back and out towards the metacone, being joined in the median transverse valley by a similar bar or ridge running forward from the outer edge of the metaconule. Together these ridges form a broad V, with the apex directed buccally. From the back of the pos-

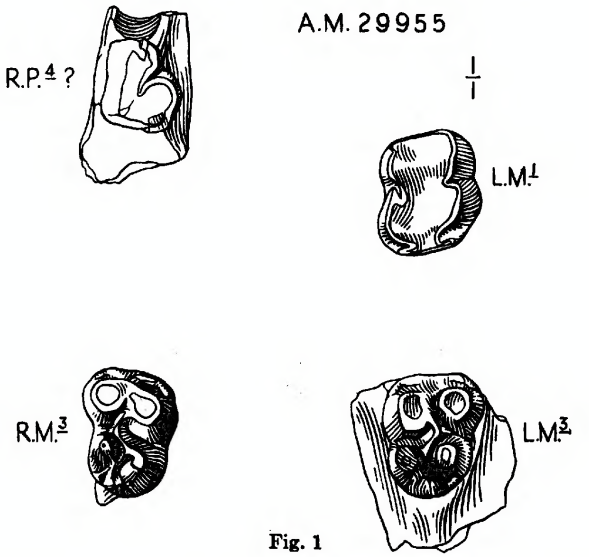

Fig. 1

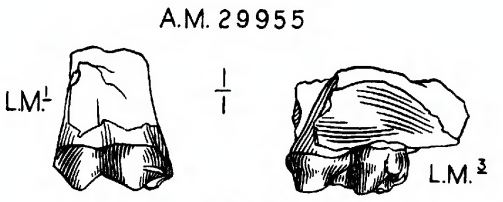

Fig. 2

Fig. 1. *Pecarichoerus orientalis*, new genus and species. Amer. Mus. No. 29955. Isolated upper cheek teeth, placed in the approximate positions they would occupy in the palate. Crown views, natural size.

Fig. 2. *Pecarichoerus orientalis*, new genus and species. Amer. Mus. No. 29955. Left upper first and third molars, placed in the approximate positions they would occupy in the palate. Side views, natural size.

terior ridge a small accessory ridge runs backwardly between the metacone and the metaconule, and having reached a point slightly behind the posterior border of the metaconule it doubles forward to join on to the postero-internal surface of that cusp. There is a posterior cingulum. The enamel is very smooth.

DISCUSSION

The presence of the peculiar oblique ridges in the molar described above, at once suggested that these teeth might represent a primate related to *Oreopithecus*, a characteristic Pliocene genus of Europe. A comparison shows, however, that the third molar is not only much longer in proportion to its width than is the case in *Oreopithecus*, but also that the ridges are arranged quite differently in the two genera, as is shown by the accompanying diagram (figure 3). Thus the resemblances to *Oreopithecus* are seen to be fortuitous, rather than real, and we must needs look elsewhere for homologous comparisons.

Turning now to the Suidae, we find that the two genera offering the closest comparisons to the specimens under consideration are *Palaeochoerus* and *Hyotherium*. We might expect these genera to be similar to the genus now in question, especially as they are of contemporaneous or of earlier ages. In *Palaeochoerus*, however, the third molar is seen to have a

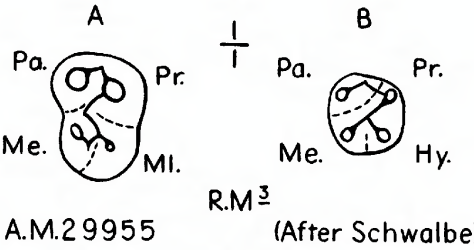

Fig. 3. Diagram to show the relationships of cusps and ridges in the right upper third molars of (A) *Pecarichoerus orientalis*, and (B) *Oreopithecus bambolii*. Crown views, natural size.

quite different shape from the corresponding tooth in *Pecarichoerus*, for in the suid the tooth is transversely broad at the anterior end, narrowing from there back to a pointed talon, while in the supposed peccary the posterior end of the tooth is more nearly equal to the anterior end in its transverse measurement, and in addition there is no talon, but only a rounded cingulum. Moreover, in *Palaeochoerus* there are numerous wrinklings in the enamel, while in *Pecarichoerus* the enamel is very smooth. Then again, in *Palaeochoerus* the cusps are not as separate nor as round as in the Indian peccary. Finally, there are no semblances of oblique ridges in *Palaeochoerus*, but rather the median valley of the molar is occupied by a small tubercle.

The same differences that set *Palaeochoerus* apart from *Pecarichoerus* also serve to distinguish *Hyotherium* and *Conohyus* from it, except that

in these latter genera the enamel tends to be rather smooth. Perhaps this brief résumé will show that there are no striking resemblances to be found between *Pecarichoerus* and any of the Suidae most nearly like it.

There now remain the peccaries to be considered. In North America *Perchoerus* (*Thinohyus*) is the characteristic Oligocene genus of this family, while *Prosthennops* is the form most common to the upper Miocene and the Pliocene. Taking these two genera together, it is seen that they demonstrate practically all of the characters that distinguish the seemingly peculiar Siwalik teeth described above. Thus, in the third upper molar of *Perchoerus* and *Prosthennops:*

1. The tooth does not taper to the back, nor is there a distinct talon. The posterior end of the molar is characterized by its rounded cingulum. (In shape the *Prosthennops* molar most closely resembles that of *Pecarichoerus.*)
2. The enamel is smooth.
3. The cusps are separate from each other.
4. In *Perchoerus* there is an intermediate protoconule and a metaconule, with broad and distinct oblique ridges running forward and back from the former, and forward from the latter. The ridges from each of these cusps meet in the median valley, to form an outwardly directed V. One need only imagine an accentuation of the oblique ridges of *Perchoerus*, accompanied by certain proportional changes in the molar, to arrive at the condition typical of *Pecarichoerus.*

Continuing, we may turn to a comparison of *Pecarichoerus* with *Doliochoerus*, a genus found in the Phosphorites du Quercy (Oligocene) of France. Miss Pearson has shown that *Doliochoerus* is a peccary, basing her conclusions on the following osteological characters.

1. The glenoid surface is lower than the basicranium.
2. The postglenoid process projects considerably below the posttympanic process.
3. The tympanic "neck" is concealed by a meeting below it of the postglenoid and the posttympanic.
4. A broad groove projects up from the glenoid on the postero-external side of the zygoma.
5. The pterygoids are rather small.
6. The paroccipital process is seemingly rather short and wide, and is posterior to the glenoid.[1]

It might be well to add that the molar teeth of *Doliochoerus*, by virtue of their simple quadritubercular form and their relative shortness, would seem to be more like the molars of a peccary than of a true suid.

[1]Pearson, H. S. 1927. *Op. cit.*, pp. 400–402.

Therefore, on the basis of all the evidence presented above, it seems pretty safe to conclude that *Doliochoerus* is a peccary, closely related to *Perchoerus*.[1]

Now when we compare the molars of *Pecarichoerus* with those of *Doliochoerus*, we see that a great resemblance exists between the two genera. Both show the comparatively short, quadritubercular molars, having the cusps arranged somewhat obliquely to the midline of the

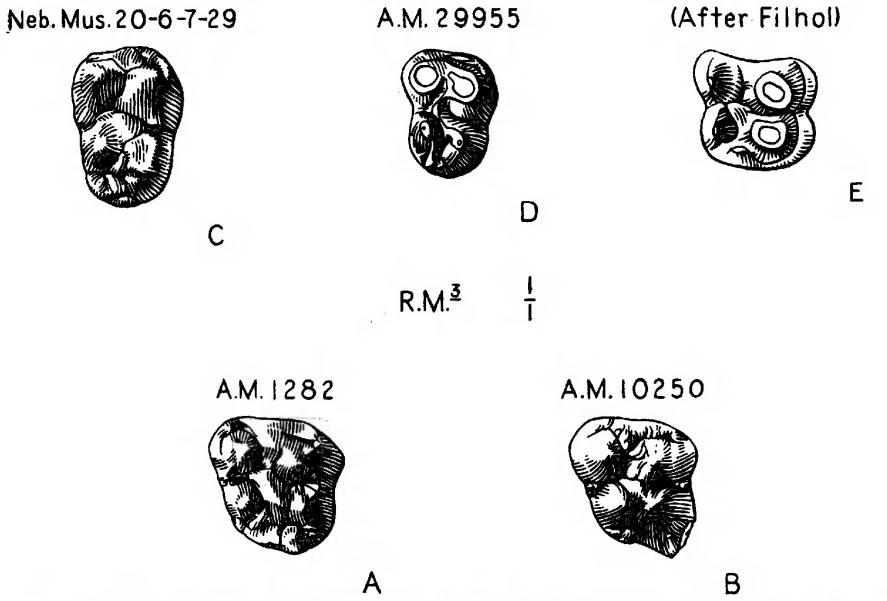

Fig. 4. Comparison of the right upper third molars in various fossil pigs and peccaries. Natural size.

A. *Perchoerus probus* Leidy. Amer. Mus. No. 1282. Protoceras beds, Brulé formation, upper Oligocene. Cheyenne River, South Dakota.

B. *Palaeochoerus meissneri* v. Meyer. Amer. Mus. No. 10250. Lower Miocene, Eckingen bei Ulm, Germany.

C. *Prosthennops* sp. Nebraska State Mus. No. 20–6–7–29. Lower Pliocene, near Ainsworth, Nebraska.

D. *Pecarichoerus orientalis*, new genus and species. Amer. Mus. No. 29955. Chinji Beds, Lower Pliocene. Near Chinji Rest House, Northern Punjab, India.

E. *Doliochoerus quercyi* (Filhol). [Copied from a plate by Filhol.] Phosphorites du Quercy, Oligocene, France.

tooth. Both genera are characterized by smooth enamel. In both, the cusps are separate from each other. True enough, *Doliochoerus* does not show as great a development of the intermediate ridges as does *Pecarichoerus*, but this is a difference of degree rather than of kind. Consequently, on the basis of the above evidence, it would seem that *Pecarichoerus* is a true but specialized peccary, related to *Perchoerus* and *Prosthennops* of North America, and more closely to *Doliochoerus* of Europe.

[1]Pearson, H. S. 1927. *Op. cit.*, p. 458.

TABLE OF MEASUREMENTS

Pecarichoerus orientalis, new genus and species. Amer. Mus. No. 29955.

M^1	Length 13.5 mm.	Width 12.5 mm.	Index 93
M^3	Length 14	Width 12	Index 86

Prosthennops sp. Neb. Mus. No. 20–6–7–29.

M^3	Length 18 mm.	Width 13.3 mm.	Index 74

Perchoerus probus Leidy. Amer. Mus. No. 1282.

M^3	Length 15.5 mm.	Width 14 mm.	Index 90

Palaeochoerus meissneri v. Meyer. Amer. Mus. No. 10250.

M^3	Length 16 mm.	Width 14.6 mm.	Index 91

CONCLUSIONS

There now comes the question of the derivation of *Pecarichoerus* and the implications raised by its presence in India. The older theory as to the separate origin of the pigs and peccaries (mentioned above) has been more or less disproven by the recent work of Miss Pearson. She has clearly demonstrated that the American genus, *Perchoerus*, and the European form, *Palaeochoerus*, are indeed closely related, and that they have descended from a not very distant common ancestor. According to Miss Pearson, *Palaeochoerus* is the European derivative of this common ancestral stock, and it gave rise to the true pigs, while *Perchoerus* is the American derivative which gave rise to the peccaries.

At the same time, *Doliochoerus* is an European cousin of *Perchoerus*, and must be regarded as a persistent remnant staying on near the center of origin of the group. *Pecarichoerus* now takes a position similar to that of *Doliochoerus*, in that it represents a persistent remnant near the center of origin for the peccaries.

We may imagine an Eurasiatic origin for the common ancestor of the pigs and the peccaries. Early in the history of the Tayassuidae, the group migrated to the Western Hemisphere (possibly by way of a trans-Bering land bridge), while a few hardy forms lingered on for a short time in the Old World. These holdovers we see in the genera *Doliochoerus* and *Pecarichoerus*, in Europe and in Asia respectively.

Recent evidence is accumulating to show that various Indian and Asiatic genera crossed to California in Tertiary times, and it would seem likely that the peccaries followed this general movement.[1]

[1]See papers by Merriam, Stock, Moody, Hall and Frick, cited in the bibliography.

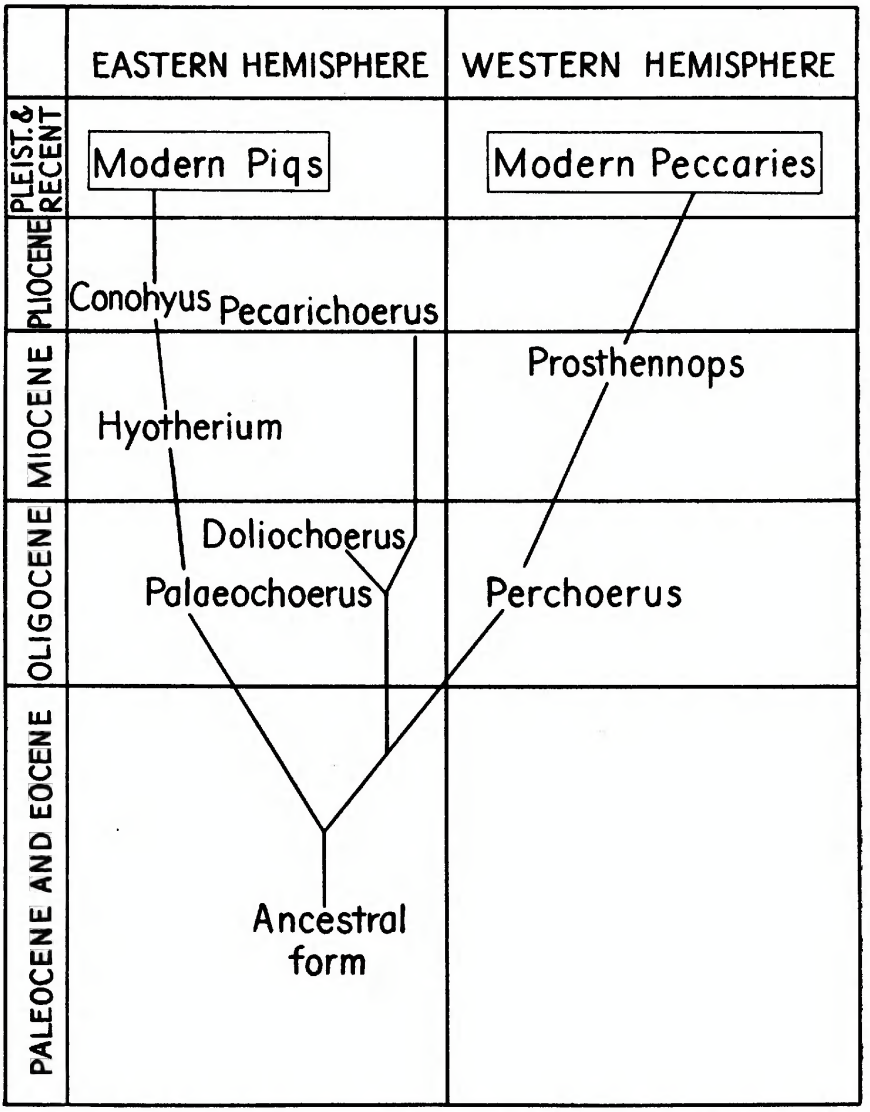

Fig. 5. Diagram, to show in an abbreviated form, the geologic and geographic relations of the pigs and peccaries.

BIBLIOGRAPHY

FILHOL, H. 1881. 'Étude des Mammifères de Saint-Gérand le Puy (Allier).' Biblio. de l'École des Hautes Études, Sec. des Sci. Nat., XX, Art. 1, pp. 6–40, Pls. IV–IX.

1882. 'Mémoires sur Quelques Mammifères Fossiles des Phosphorites du Quercy.' Toulouse. Pp. 36–39, Pls. XII, XIII.

FRICK, CHILDS. 1921. 'Extinct Vertebrate Faunas of the Badlands of Bautista Creek and San Timoteo Canyon, Southern California.' Bull. Dept. Geol. Univ. Calif., XII, p. 342.

LYDEKKER, R. 1884. 'Siwalik and Narbada Bunodont Suina.' Mem. Geol. Surv. India, Pal. Indica (X), III, Pt. 2, pp. 95–99.

MATTHEW, W. D. 1915. 'Climate and Evolution.' Ann. New York Acad. Sci., XXIV, p. 241, fig. 21.

1929. 'Critical Observations upon Siwalik Mammals.' Bull. Amer. Mus. Nat. Hist., LVI, Art. VII, pp. 453, 455, 459.

MERRIAM, J. C., STOCK, CHESTER, AND MOODY, CLARENCE L. 1916. 'An American Pliocene Bear.' Bull. Dept. Geol. Univ. Calif., X, No. 7, pp. 87–109.

PEARSON, H. S. 1927. 'On the Skulls of Early Tertiary Suidae, together with an account of the Otic Region in some other Primitive Artiodactyla.' Phil. Trans. Roy. Soc. London, Series B, CCXV, pp. 400–403, 409–410, 458, figs. 10, 11.

1932. 'Some Skulls of *Perchoerus* [*Thinohyus*] from the White River and John Day Formations.' Bull. Amer. Mus. Nat. Hist., XLVIII, Art. III, pp. 61–96.

PILGRIM, G. E. 1910. 'Preliminary Note on a Revised Classification of the Tertiary Freshwater Deposits of India.' Rec. Geol. Surv. India, XL, Pt. 3, p. 202.

1926. 'The Fossil Suidae of India.' Mem. Geol. Surv. India, Pal. Indica, N.S., VIII, No. 4.

SCHWALBE, G. 1915. 'Über den fossilen Affen *Oreopithecus bambolii*.' Zeitschr. für Morph. und Anthropologie, XIX, Heft I, pp. 150–254.

STEHLIN, H. G. 1899. 'Geschichte des Suiden Gebisses.' Abh. der Schw. Pal. Gesellschaft, XXVI.

STOCK, CHESTER, AND HALL, E. RAYMOND. 1933. 'The Asiatic Genus *Eomellivora* in the Pliocene of California. Journ. Mamm., XIV, No. 1, pp. 63–65.